MISSISSIPPI ANNUAL COOL-SEASON FORAGE CROP

VARIETY TRIALS, 2020

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MISSISSIPPI'S OFFICIAL VARIETY TRIALS

MISSISSIPPI STATE UNIVERSITY™
MS AGRICULTURAL AND
FORESTRY EXPERIMENT STATION

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2020

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Find variety trial information online at ***mafes.msstate.edu/variety-trials***.

Mississippi Annual Cool-Season Forage Crop Variety Trials, 2020

Introduction

Varieties of several forage-crop species are evaluated every year in the Mississippi Agricultural and Forestry Experiment Station's (MAFES) small-plot forage trials. Entries are provided by seed companies and forage and breeding programs at state universities. Experimental and commercially available varieties are tested at one or more locations across Mississippi. All entries from privately owned companies are tested on a fee basis. Some varieties may be added by MAFES forage variety testing program as a reference for comparison purposes. In addition, varieties of interest may also be added when applicable. Testing during 2019-2020 was conducted at the following locations: Prairie Research Unit (Prairie), Leveck Animal Research Center Forage Unit (Mississippi State campus), Coastal Plain Branch Experiment Station (Newton), and White Sands Research Unit (Poplarville). However, due to flooding and overall plot failure, only the Starkville location was analyzed.

Data presented in Tables 2–4 was used to evaluate the performance of each forage crop within its respective trial. Mean and harvest comparisons were statistically evaluated by using the least significant difference (LSD) test at the probability level of $\alpha = 0.05$. The LSD value represents the minimum amount of dry matter yield (pounds of dry matter per acre) that must be observed between any two varieties to determine if the difference was due to variety performance alone. Sources of seed are presented in Table 5.

Protocol

Annual ryegrass, small grains, and clover trials across the state were established from October to November 2019. At all locations, soil samples were taken and analyzed by the Mississippi State University Soil Testing Laboratory. Trial areas were amended with lime and fertilized with phosphorus (P_2O_5) and potassium (K_2O) according to the soil test recommendations for individual species. Grass trials were additionally fertilized with 50 pounds of nitrogen per acre at planting and after each harvest using urea ammonium sulfate (33-0-0/11S). Plots were 6 feet by 10 feet and planted using a precision cone seeder on a prepared seedbed. Trial design was a randomized complete block replicated four times. The seeding rates are presented in Table 1. Individual trials were harvested when 75% of the plots

Table 1. Recommended seeding rates for cool-season forage crops.

Type/Species	Seed rate
	lb/A
Annual Grasses	
Rye	100
Oat	100
Triticale	100
Ryegrass	30
Annual Clovers	
Arrowleaf	10
Berseem	25
Balansa	4
Ball	3
Crimson	30
Persian	8

achieved 15 inches of growth. All plots were harvested to a 3-inch stubble height. Plots were harvested using a Winterstieger Cibus F equipped with a forage plot harvester reel type header that collected a 4.8-foot by 10-foot swath to calculate total yield. A subsample was collected and dried at 130°F until constant weight was achieved to calculate DM concentration. Data were analyzed using the General Linear Model (PROC GLM) of SAS and mean separation was conducted using LSD at $\alpha = 0.05$.

Annual Ryegrass

Introduction

Annual ryegrass is the most relevant and versatile cool-season annual grass for livestock producers in Mississippi. In pasture and hay systems, annual ryegrass is a popular forage because of its ease of establishment, high nutritive value, high yielding potential, good reseeding ability, and adaptability to a wide range of soil types. Annual ryegrass can be established in pure stands or mixed with small grains and/or clovers for cool-season forage production. For these reasons, annual ryegrass is a staple for many cool-season grazing programs in Mississippi. Recommended planting dates vary by location but usually fall between September to mid-October for prepared seedbed or late October if overseeded on a warm-season perennial grass pasture. Seeding rates are 30 pounds per acre for pure stands and 20 pounds per acre for mixtures with small grains and/or clovers. Annual ryegrass is very responsive to nitrogen fertilizer, and its use should be split into two applications for grazing systems. Reasonable productivity can be expected from November to May in the southern part of Mississippi and February to May in the northern part of Mississippi. Annual ryegrass should normally be allowed to reach an initial height of at least 10 inches before grazing begins.

Results

Data in Table 2 present the yield performance of ryegrass varieties in Starkville. The mean yield of the first harvest was 1,279 pounds per acre. Among replications, variety performance was highly variable leading to minimal statistical differences between varieties. In the second harvest, the mean yield was 3,259 pounds per acre, the greatest among individual harvest. The mean yield of the third was 1,135 pounds per acre, less than the first and second harvests. The total seasonal mean was 5,635 pounds per acre with yield ranging from 4,062 to 6,922 pounds per acre among varieties.

Table 2. Annual ryegrass production by harvest date and total yield in Starkville.

Variety	Harvest date			Total yield
	3/8/20	4/16/20	5/19/20	
	lb/A	*lb/A*	*lb/A*	*lb/A*
Attain	1241	2846	1318	5405
Baqeuano	961	3342	1161	5464
Big Boss	1504	2936	1209	5648
ChuckWagon	1010	3073	1306	5389
Diamond T	630	3494	1404	5370
Double Diamond	1794	3202	1927	6923
FL4X late	1538	2653	910	5100
FL4xR16	1914	2868	1564	6345
Flying A	702	4152	1261	6114
Frost Proof	1123	3152	1172	5447
Green Farm 2	1457	3927	943	6327
Grits	1037	3190	817	5044
Jackson	1564	3465	1005	6033
KO14-Wear	967	3222	995	5183
Lonestar	1298	3512	949	5759
LSC-B1191	862	3400	1585	5846
M2CVS	1216	3374	1005	4683
Marshall	1307	3699	920	5926
ME4	1852	2994	1163	6010
ME-94	1175	3565	823	5563
Nelson	1134	3207	1466	5808
Passerel Plus	810	3353	1075	5035
PPERC7	946	2861	613	4419
Prine	1606	2794	1247	5647
Ranahan	1549	2824	1343	5716
Rapido	652	3337	653	4641
RM4L	1610	2915	802	5327
TAMTBO	818	3200	1025	5043
Tetrastar	1603	3630	1487	6720
Triangle T	1597	2759	1219	5575
Trinova	1451	3759	1370	6580
Winterhawk	1088	3001	1090	5179
WMWL	1364	3806	1027	6196
WMWL-2	2096	3287	749	6131
Mean	1279	3259	1135	5635
CV, %	35	23	32	19
LSD 0.05	1170	1054	664	1515

Planted: 10/18/19
Fertilizer: 50 lb/A of N (33-0-0S) before planting after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid and 2,4-D) after first harvest
Soil type: Marietta Fine Sandy Loam

Small Grains

Introduction

In Mississippi, small grains (oat, wheat, rye, and triticale) are not utilized as extensively for forage production as annual ryegrass because of lower annual DM yields. However, some small grains tend to be more drought- and cold-tolerant than ryegrass and can provide highly digestible forage when other forages are not available. They can also be used for early grazing during the transition period from summer perennial grasses to annual ryegrass grazing. Cereal rye and triticale are the most cold-tolerant of small grains, and therefore have potential to continue vegetative growth during the fall and winter months in Mississippi.

Results

Data presented in Table 3 represent forage DM yields in Starkville. The first harvest of small grains was over a week earlier than the ryegrass harvest averaging over 200 pounds per acre. However, oats averaged less than 1,000 pounds per acre. The second harvest had a mean yield of 3,350 pounds per acre, with some oats and triticale varieties producing over 5,000 pounds per acre. The two harvests combined produced an average seasonal yield of 5,357 pounds per acre.

Table 3. Small grain yield in Starkville.

Species	Variety	Harvest date		Total yield
		2/28/20	4/20/20	
		lb/A	*lb/A*	*lb/A*
Rye	Bates RS4	3146	2203	5349
Oats	Bob	102	1714	1765
Rye	Elbon	936	4623	5558
Oats	LA99016	1395	5661	7056
Wheat	NF00108	2350	3339	5689
Wheat	NF101	2526	2613	5139
Rye	NF95319B	2825	2631	5457
Wheat	NF97117	2415	2851	4662
Rye	NF97325	2579	2769	5348
Rye	NF99362	2875	3141	6016
Wheat	ON1366277	2619	2697	5316
Wheat	ON13PO16	2107	3025	5132
Triticale	Trical 1143	152	2693	2806
Rye	Trical Exp 19R01	2068	2709	4777
Triticale	Trical Flex 719	1883	5549	7432
Triticale	Trical Merlin Max	2869	3351	6220
Triticale	Trical Surge	2083	3632	5715
Triticale	Trical Thor	1885	5101	6986
Mean		2045	3350	5357
CV, %		28	30	18
LSD (0.05)		832	1423	14

Planted: 10/18/19
Fertilizer: 50 lb/A of N (33-0-0S) at planting and after each harvest
Herbicide: 1 qt/A of GrazonNext® (aminopyralid & 2,4-D) after first harvest
Soil type: Marietta Fine Sandy Loam

Annual Clover

Introduction

The addition of annual clovers may reduce some nitrogen input needs and improve forage quality in pastures. For this reason, they can be beneficial in Mississippi when interseeded into annual cool-season grass pastures. Crimson clover is an early-maturing clover that produces excellent forage though it has relatively poor reseeding abilities, necessitating reseeding each fall. Crimson clover will produce more forage at lower temperatures than other clovers. Ball clover is very tolerant to poor drainage, is more tolerant to acidity than crimson clover, and tolerates heavy grazing while maintaining good reseeding potential. Berseem clover is tolerant of alkaline and wet soils, though most varieties are not cold-tolerant. Balansa, berseem, and arrowleaf are the most late-maturing clovers.

Results

Data presented in Table 4 represent forage DM yield data from annual clover trials at Starkville. Three harvests from March to June make up the total seasonal yield. Mean harvest yields were 1,387, 2,128, and 1,205 pounds per acre for three harvests. However, by the third harvest, only red clover and berseem clover were actively producing forage biomass.

Table 4. Annual clover production by harvest and total yield in Starkville.

Species	Variety	Harvest date			Total yield
		3/15/20	5/1/20	6/5/20	
		lb/A	*lb/A*	*lb/A*	*lb/A*
Crimson	SECCB18	1655	2271	—	3926
Crimson	SECCM18	2166	1121	—	3287
Red Clover	GA 9908	143	2977	1383	4504
Berseem	Balady	246	1263	648	2157
Crimson	Dixie	2364	1335	—	3698
Balansa	Viper	1824	2481	—	4305
Balansa	Taipan	1714	1628	—	3342
Arrowleaf	Blackhawk	465	2663	—	3128
Balansa	Fixation	1666	2578	—	4243
Berseem	Frosty	1767	3415	976	6158
Crimson	Blaza	2220	1458	—	3678
Berseem	Super 10	637	2733	1814	5184
Crimson	White Cloud	1164	1739	—	2903
Mean		1387	2128	1205	3885
CV, %		25	28	30	34
LSD (0.05)		1153	877	871	1862

Planted: 10/18/19
Fertilizer: 100 lb/A of 0-0-60
Herbicide: 5 oz/A of Pursuit® (imazethapyr)
Soil type: Marietta Fine Sandy Loam

Table 5. Seed sources for the 2019–20 annual cool-season forage variety testing program.

Species/Variety	Seed company/source	Species/Variety	Seed company/source
Annual Ryegrass		**Annual Clovers**	
Lonestar	Grassland Oregon	Blackhawk	Oregro Seeds Inc.
Tetrastar	Grassland Oregon	Fixation	Grassland Oregon
LSC-B1191	Lewis seed company	Viper	Smith Seed Services
ChuckWagon	Lewis seed company	Taipan	Smith Seed Services
Grits	Lewis seed company	Super 10	Baranburg
Ranahan	Mountain View Seeds	Frosty	Grassland Oregon
Double Diamond	Oregro Seeds Inc.	Balady	Smith Seed Services
Triangle T	Oregro Seeds Inc.	Blaza	Baranburg
Diamond T	Oregro Seeds Inc.	White Cloud	Oregro Seeds Inc.
Flying A	Oregro Seeds Inc.	SECCB18	Smith Seed Services
TAMTBO	Oregro Seeds Inc.	SECCM18	Smith Seed Services
KO14-Wear	Oregro Seeds Inc.	Dixie	Smith Seed Services
Winterhawk	Oregro Seeds Inc.	GA 9908	Smith Seed Services
Passerel Plus	Pennington	**Small Grains**	
PPERC7	Pennington	LA99016	Ragan and Massey
Prine	Ragan and Massey	Bates RS4	The Noble Foundation
RM4L	Ragan and Massey	NF97325	The Noble Foundation
Big Boss	Smith Seed Services	Elbon	The Noble Foundation
Baqeuano	Smith Seed Services	NF95319B	The Noble Foundation
Rapido	Smith Seed Services	NF99362	The Noble Foundation
Attain	Smith Seed Services	Trical Exp 19R01	Trical Superior Forage
Trinova	Smith Seed Services	Trical 1143	Trical Superior Forage
Frost Proof	Smith Seed Services	Trical Surge	Trical Superior Forage
Green Farm 2	Smith Seed Services	Trical Merlin Max	Trical Superior Forage
Jackson	The Wax Company	Trical Thor	Trical Superior Forage
M2CVS	The Wax Company	Trical Flex 719	Trical Superior Forage
Marshall	The Wax Company	NF00108	The Noble Foundation
ME4	The Wax Company	NF97117	The Noble Foundation
ME-94	The Wax Company	NF101	The Noble Foundation
WMWL	The Wax Company	ON13PO16	The Noble Foundation
WMWL-2	The Wax Company	ON1366277	The Noble Foundation
Nelson	The Wax Company		
FL4xR16	University Florida		
FL4X late	University Florida		

MS AGRICULTURAL AND
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Reuben Moore, Interim Director **www.mafes.msstate.edu**

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